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PROFITS IN FARMING ON IRRIGATED AREAS IN UTAH LAKE VALLEY.

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INTRODUCTION.[1]

The aim of the work in this farm-management survey was (1) to determine the profits that farmers receive in the irrigated areas and (2) to analyze the farm business and thereby to determine what factors apparently control their income. Data were also needed in respect to certain farm enterprises to determine the feasibility of developing these on the new areas that are to be opened up by the Strawberry irrigation project. Such investigations are particularly desirable at this time in view of the fact that this project, which it is estimated will furnish water for 60,000 acres of land, is now nearing completion.

Much of the area included in this project is now dry farmed or only partially irrigated. With the large quantity of water available at its completion it becomes important that the farms on the new areas be carefully organized, so as to insure a proper and safe development of the entire agricultural district. It is necessary to know the size of the farm and the type of agriculture that will succeed under the conditions existing in the valley where the project is situated.

All data included in this bulletin have been obtained by personal interviews with farmers in the area considered. Although the information in many cases is based on the farmers' estimates, it is believed that the results are reasonably accurate for all practical purposes. The field studies were made in October, 1913. The results, therefore, pertain to the crop season of that year.

[1] Acknowledgment is due to R. J. Evans and D. W. Working, who assisted in collecting the data presented in this bulletin. Valuable aid was received from the report of a soil survey of Provo area, Utah, published in 1903 by the Bureau of Soils of the United States Department of Agriculture. Thanks are extended to the many farmers in the regions studied through whose courtesy this work was made possible.

Note.—This bulletin deals with the results of a farm-management survey of about 100 irrigated farms in Utah Lake Valley in Utah.

DESCRIPTION OF THE REGION.

The region studied is the Utah Lake Valley in the vicinity of Provo, Springville, Spanish Fork, Payson, and Lehi. (See fig. 1.) In general there are two prominent physiographic features: (1) An area of sloping land adjacent to the base of the mountains and usually above the present systems of irrigation and (2) a larger and more nearly level area farther removed from the mountains and generally under irrigation.

The first area consists chiefly of coarse material, sand, gravel, stones, and bowlders, and the surface is usually rough and uneven. It is derived chiefly from the adjacent mountains and has been brought into the valley by inflowing streams and rains. These higher areas are commonly called bench lands. Many orchards have been planted on them, for the reason that the location renders the fruit less liable to frost injury because of better air drainage (fig. 2). The soil is very porous in character and seemingly not as rich as that at the lower levels.

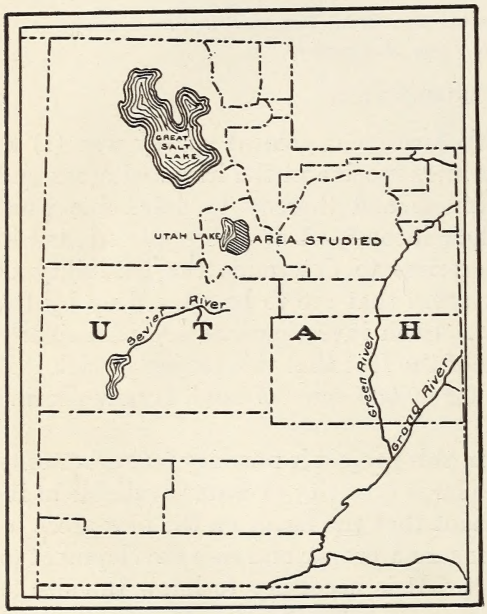

FIG. 1.—Sketch map of the State of Utah, showing the location of the region studied near Utah Lake.

The second area is made of the finer sediments deposited by ancient Lake Bonneville, and since its subsidence these sediments have been considerably modified by inflowing streams and weathering. This area occupies the lower levels extending down to the shore of Utah Lake, which forms its western boundary. Utah Lake is a shallow body of fresh water having an outlet through the Jordan River into the Great Salt Lake. Much of this lower type of land is used only for pasture, the water table being within a few feet of the surface. Where saturated for any great length of time, the alkaline conditions become so bad that cultivated crops are no longer possible. Sugar beets constitute the important crop on these lower and heavier soils.

SOILS OF THE REGION.

Throughout the entire region more or less alkali is found. Most of this occurs on the lower levels. The higher lands are of a porous

nature; hence, the drainage is much better. In some sections the soil is very badly affected with alkali, so strongly as to prohibit the cultivation of crops. In many places this condition is the result of seepage of irrigation waters used on the bench lands near the base of the mountains (fig. 3). Over many of the lower areas the alkaline conditions result from rapid evaporation, due to the surface of the soil being within capillary reach of the ground water. This feature of the situation is discussed in the report of the Bureau of Soils on the soil survey of the Provo area.

HISTORY OF AGRICULTURAL DEVELOPMENT.

The first settlers of Utah Lake Valley came from Illinois, halting on their journey for a year at Salt Lake City. The first company,

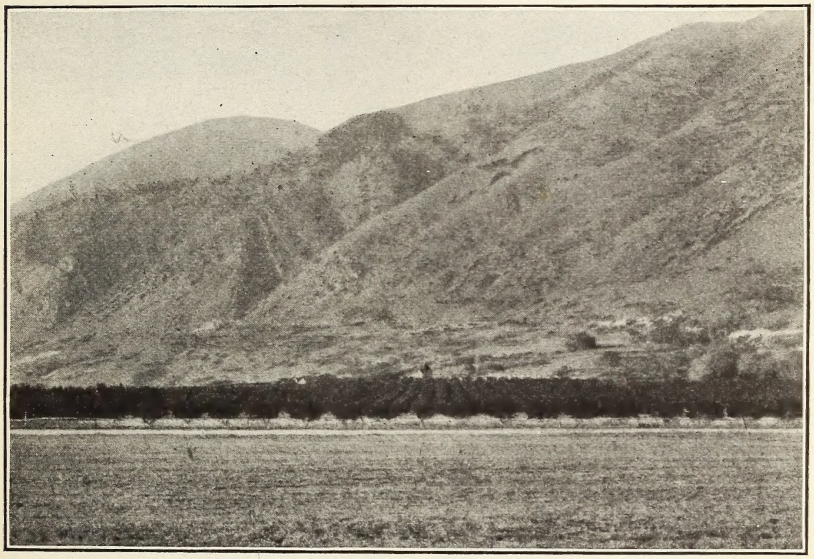

FIG. 2.—Peach and apple orchards planted at the bases of mountains or near the mouths of canyons, to insure good air drainage.

consisting of 30 families, came early in March, 1849, and settled close to the site of Provo. By the middle of March they had built a fort, consisting of log houses surrounded by a stockade, from the center of which, overlooking all, arose a long parapet upon which was mounted one or more cannon for protection against possible attacks from the Indians.

Meantime the settlers had taken up land along Provo River, near the present site of Provo, and had plowed, fenced, and planted with corn, wheat, and rye the greater part of a field consisting of 225 acres of land. Soon afterwards 10 more families joined them, and the field was divided into 40 lots and 1 lot given to each family.

Immediately upon planting their crops the settlers began to use the water of the stream for irrigation. A number of farmers joined together and by their united labors constructed a canal that brought water to their farms. These were among the first steps toward irrigation in the West.

The first attempt at agriculture by the new settlers was not very successful, as Indian troubles during this time were frequent and the men could not give their crops the attention which they required. The second year was more successful, and good crops of wheat, corn,

FIG. 3.—A wide irrigation ditch, entailing much waste of water.

rye, and barley were obtained. In the years that followed, more settlers came into the country, taking up land in different parts of the valley. For many years corn, wheat, barley, and potatoes were the principal products.

By far the most important crop in the valley at the present time is the sugar beet, this industry having started about 20 years ago. Fruit growing, especially apples and peaches, is of more recent introduction, having had a great impetus about five years ago. The farms as a rule are small in area and are intensively worked. Large numbers of owners live in town and have land on the outskirts of the village.

Nearly all of the settlers in this valley are affiliated with the same church, to which they are deeply loyal, and it is difficult to measure the influence this factor has had in the agricultural development of the district. The children, naturally wishing to retain their church connections, have stayed at home. This has resulted in the subdivision of many of the larger farms into small areas, which has unquestionably been one of the reasons for the development of the intensive type of agriculture prevailing in this section.

PROFITS IN FARMING IN THIS REGION.

CLASSIFICATION OF FARMS BY GROUPS.

Financial statements of the year's business were obtained from 118 farms. In this study the farmers whose records appear were divided into the following classes: (1) Owners, (2) owners renting additional land, and (3) tenants. Of the 118 records received, 69 were from farms operated by owners, 23 from farms operated by owners renting additional land, and 3 from farms operated by tenants. A few records that were not considered complete and accurate were discarded. Records from farmers 50 per cent of whose total receipts came from work done outside the farm were also omitted. All records have been checked carefully, and the 95 used in this report should represent with fair accuracy the agricultural conditions in the valley.

In order to present the data clearly, certain terms which will be used throughout the discussion are here defined. It is important that the reader thoroughly understand them, for such knowledge will materially assist in the interpretation of the results.

Farm capital.—The farm capital is the average at the beginning and at the end of the year of the value of all real estate, improvements, machinery, live stock, feed and supplies, and cash necessary to carry on the farm business. It includes the value of the farmhouse but not of the household furnishings.

Receipts.—The farm receipts include the amount received from the sale of all farm products and also the receipts from outside labor, rent of buildings, etc. If the value of buildings, stock, produce, or equipment is greater at the end of the year than at the beginning, the difference is considered a receipt.

Expenses.—The farm expenses represent the amount of money paid out during the year to carry on the farm business. If the value of buildings, stock, produce, or equipment at the end of the year is less than at the beginning, this decrease is considered an expense. Household or personal expenses are not included, except the value of board furnished to hired help.

Farm income.—The farm income is the difference between the receipts and expenses. It represents the amount of money available for the farmer's living, provided he has no interest to pay on mortgages or other debts.

Labor income.—The labor income is the amount that the farm operator has left for his labor after 5 per cent interest on the average capital is deducted from the farm income. It represents what he earned as a result of his year's labor after the earning power of his capital has been deducted. In addition to the labor income the operator received a house to live in, fuel (when cut from the farm), garden products, milk, butter, eggs, etc. The labor income corresponds to what a hired man receives when he is given so much wages in cash, together with board and room.

DISTRIBUTION OF FARM AND LABOR INCOMES.

For the purpose of this study the 69 records from farm owners were divided into three groups, as shown in Table I. The first group represents fruit and truck farms, each of which has a cultivated area usually of less than 25 acres. The main crops are beets, fruit, and truck, as more than one-half of the receipts come from these crops.

The second group comprises those general farms each of which has an area in crops exceeding 25 acres. Their owners grow practically the same kinds of crops as those on the small farms, but a larger proportion of their crop receipts are from sugar beets, grain, and hay. Over two-thirds of their entire farm receipts come from the sale of crops.

The third group, only four in number, includes grain and live-stock farms. Less than one-third of the receipts on these farms comes from the sale of crops, while more than one-half is from the sale of live stock and live-stock products.

TABLE I.—*Average area, capital, receipts, expenses, farm income, and labor income on 69 farms operated by their owners in Utah.*

Items of inquiry (averages).	First group, 35 small farms.	Second group, 30 fruit and beet farms.	Third group, 4 grain and live-stock farms.	Average for all 69 farms.
Size of farms.....acres..	20.5	59.6	178	46.6
Crop area.....do....	16.5	42.1	73.6	30.9
Capital.....	$5,684	$11,802	$16,989	$9,000
Receipts.....	954	1,969	2,420	1,480
Expenses.....	423	790	951	613
Farm income.....	531	1,179	1,469	867
Labor income.....	247	589	620	417

Table I shows that the average size of the 35 small farms is 20½ acres, with 16½ acres in crops. The average labor income of this group is $247. This amount represents the farmer's wages for his year's work. In addition to the $247, he had the use of the house to live in and those products which the farm furnished toward his living. If he had to pay no interest on a mortgage, he had the total amount of the farm income, which is $531, to use for savings and living expenses. Of the 35 farms in this group, one-fifth of them failed to make a plus income. Two-thirds received less than $300 for their year's work.

The second group of farms, 30 in number, is of the same general type, but they are much larger in size, the average area being nearly 60 acres. Their capital is about double and their labor income of $589 is more than twice that of the average small farm. Over two-thirds of those in this group had a labor income of more than $300, and over half made more than $500.

The four grain and live-stock farmers received a labor income of $620 on the average, which sum is in keeping with the larger area and capital used. The average labor income of all the farm owners studied was $417, from an average investment of $9,000 per farm.

In Table II are given the results from the 23 farms where the operator owns a small area and rents additional land. These have been divided into 13 general farms and 10 small farms.

TABLE II.—*Average area, receipts, expenses, farm income, and labor income on 23 farms operated by owners renting additional land in Utah.*

Items of inquiry (averages).	First group, 10 small farms.	Second group, 13 general farms.	Average for 23 farms.
Farm area owned.....acres..	12.4	39.0	27.4
Additional area rented.....do....	10.3	19.6	15.6
Crop area.....do....	19.3	47.7	32.8
Capital.....	$4,085	$7,871	$6,225
Receipts.....	880	1,639	1,309
Expenses.....	445	691	584
Farm income.....	435	948	725
Labor income.....	231	554	414

With a third less capital these men made practically the same labor income as those shown in Table I. Their crop area, including that owned and rented, was about 2 acres greater than the average of those farmers who operated their own farms. By this method the farmer having small capital (in most cases only enough to own a house and a few acres of land) was able to increase his income very effectively with a small increase in capital. This method represents an intermediate step between tenant and owner, and is becoming very common in many of our agricultural districts where land is high priced.

Crop conditions, as well as the prices of farm products, were fairly satisfactory in 1913, much more so than in 1912. It is possible that the figures here given are above the normal, and this fact should be carefully considered when studying these results. This may be illustrated by the peach crop, as the data show that 15 per cent of the crop sales on small farms, or 8 per cent on all farms, is from peaches. These were worse than a total failure in this valley in 1912 on account of the low price received in the eastern markets.

Out of the total number of farms covered by the records, only three were operated by tenants. On one of these farms the tenant gave one-third of the crops as rent and made a labor income of $273 and a return of 4.1 per cent to the landlord for his capital invested. This was the smallest farm of the three, having only 35 acres. The second man gave one-half of the crops as rent and received $756 for his labor income. The landlord received 7.3 per cent. The other farm was

leased on a straight half-share system, the landlord furnishing the land, one-half the working capital, paying one-half of all the expenses, and receiving a half share of all the farm sales. In this case the operator had a labor income of $1,528 and the landlord had a return of 7.4 per cent for his capital invested.

Table III shows the average size, crop area, capital, receipts, expenses, farm income, tenant's labor income, and landlord's percentage on investment on the three rented farms.

TABLE III.—*Average capital, receipts, expenses, farm income, tenant's labor income, and landlord's percentage on investment on three rented farms in Utah.*

[Average area of farms, 54.3 acres; average crop area, 38.7 acres.]

Items of inquiry for three rented farms (averages).	Tenant.	Landlord.
Capital	$1,271	$13,145
Receipts	1,430	1,226
Expenses	574	323
Farm income	916	903
Labor income	852	.....
Percentage on investment	.....	6.9

The average labor income received by these tenants was $852, while the landlords received 6.9 per cent on an investment of $13,145.

DISTRIBUTION OF FARM RECEIPTS.

In Table IV is given the distribution of receipts on 69 farms managed by their owners.

TABLE IV.—*Distribution of farm receipts on 69 farms operated by their owners.*

Source of receipts (averages).	First group, 35 small farms.	Second group, 30 fruit and beet farms.	Third group, 4 grain and live-stock farms.	Average for all 69 farms.
Crops	$617	$1,325	$741	$932
Stock	89	126	1,094	163
Stock products	95	150	138	122
Miscellaneous	44	126	0	77
Increase of inventory (less decrease)	109	242	447	186
Total	954	1,969	2,420	1,480

Table IV shows that two-thirds of the total receipts come from the sale of crops, about one-fifth from stock and stock products, and the remainder from miscellaneous sources. This proportion is very nearly the same on both classes of farms other than the grain and live-stock farms, where the proportion of receipts from crops is only about one-third of the total. That the receipts from the farms whose owners rent additional crop areas are distributed in practically the same proportion is shown in Table V, which gives an analysis of the crop receipts on farms operated by their owners and on farms whose owners rent additional land.

TABLE V.—*Distribution of crop receipts on farms operated by their owners and on farms whose owners rent additional land.*

Source of receipts (averages).	On 69 farms operated by their owners.								On 23 farms whose owners rent additional land.					
	First group, 35 small farms.		Second group, 30 fruit and beet farms.		Third group, 4 grain and live-stock farms.		Average for all 69 farms.		First group, 10 small farms.		Second group, 13 general farms.		Average for all 23 farms.	
	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.
Corn	.....	.....	$7	1	.....	.....	$3	.....	.....	.....	$1	.....	$1	.....
Potatoes	$44	7	39	3	$10	1	40	4	$60	9	21	2	38	5
Wheat	10	2	39	3	37	5	25	3	8	1	51	5	32	4
Oats	.....	.....	39	3	86	12	22	2	5	1	22	2	15	2
Barley	4	1	43	3	.....	.....	21	2	.....	.....	18	2	10	1
Hay	28	4	125	9	170	23	78	8	27	4	112	12	75	9
Beets	188	30	746	56	438	59	445	48	498	77	674	72	598	74
Truck crops	23	4	84	6	.....	.....	48	5	.....	.....	13	2	7	1
Apples	85	14	48	4	.....	.....	63	7	2	.....	14	2	9	1
Peaches	88	14	60	5	.....	.....	71	8	23	4	5	1	13	2
Other fruit	145	24	86	6	.....	.....	111	12	23	4	1	.....	10	1
Miscellaneous crops	2	.....	9	1	.....	.....	5	1	.....	.....	2	.....	1	.....
Total	617	100	1,325	100	741	100	932	100	646	100	934	100	809	100

Table V shows that the sugar beet constitutes the important cash crop on farms of every group, forming as it does nearly 50 per cent of the total crop sales (fig. 4). In the case of those farmers renting additional land it forms nearly three-fourths of the total crop sales.

In riding through this valley one would be likely to infer that fruit constitutes a large proportion of the crop receipts. That such is not the case is shown by the data in Table V. Peaches, although occupying a place of importance, constitute only 7.6 per cent of the total crop receipts, apples a little less, while other fruits, mostly berries, constitute 12 per cent.

Previous to the introduction of the sugar-beet industry, potatoes formed one of the main cash crops on many of the farms in the valley. In recent years, however, the price of potatoes has been very uncertain, and this, with blight trouble, has been the cause of most farmers discontinuing this crop. If the farmers were assured of a reasonable price for potatoes, no doubt this crop would compete strongly with sugar beets as a cash enterprise.

DISTRIBUTION OF FARM EXPENSES.

Table VI shows the distribution of expenses on the three groups of farms operated by their owners and also on the two groups whose owners rent additional land.

FIG. 4.—Views showing the harvesting of sugar beets in one of the largest fields in the Utah Lake Valley.

TABLE VI.—*Distribution of farm expenses on 92 farms in Utah.*

Distribution of expenses (averages).	On 69 farms operated by their owners.								On 23 farms whose owners rent additional land.					
	First group, 35 small farms.		Second group, 30 fruit and beet farms.		Third group, 4 grain and live-stock farms.		Average for 69 farms.		First group, 10 small farms.		Second group, 13 general farms.		Average for 23 farms.	
	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.	Per farm.	Per cent.
Paid labor and board	$109	25.8	$171	21.6	$85	8.9	$135	22.0	$65	14.4	$112	16.2	$92	15.8
Family labor	72	17.0	264	33.4	312	32.8	169	27.6	116	26.1	186	26.9	156	26.7
Improvements and new equipment	39	9.2	49	6.2	39	4.1	43	7.0	28	6.3	60	8.9	46	7.9
Repairs (machinery, buildings, etc.)	14	3.3	21	2.7	28	2.9	18	2.9	11	2.5	18	2.6	15	2.6
Feed	49	11.6	19	2.4	108	11.5	39	6.4	46	10.4	18	2.6	30	5.1
Horseshoeing, etc	14	3.3	22	2.8	27	2.8	18	2.9	19	4.3	32	4.6	26	4.5
Seed and fertilizers	11	2.6	29	3.7	7	.7	19	3.1	16	3.6	23	3.3	20	3.4
Insurance, taxes, etc	58	13.7	111	14.0	173	18.2	88	14.4	125	28.1	161	23.3	145	24.8
Stock purchased	28	6.6	64	8.1	127	13.4	49	8.0	5	1.1	59	8.5	35	6.0
Miscellaneous	29	6.9	40	5.1	45	4.7	35	5.7	14	3.2	22	3.1	19	3.2
Total	423	100.0	790	100.0	951	100.0	613	100.0	445	100.0	691	100.0	584	100.0

Table VI develops the interesting point that the total labor expense constitutes nearly 50 per cent of the total farm expenses. This is in a large measure due to the intensive type of agriculture followed in that district. Of this labor less than half is hired. This is the only region in which farm-management surveys have been made where the expense of unpaid family labor is greater than that for hired labor. The sugar-beet industry may account for this condition. Taxes are high throughout the entire region and form over 15 per cent of the total farm expense.

SUGAR-BEET GROWING ON SMALL FARMS.

In Table VII data are given for 25 small farms on which sugar beets are the leading cash crop, no fruit being grown. Sixteen of these farms were operated by their owners; the other nine were farms whose owners rented additional land. There was an average of 5.2 acres of beets per farm on those operated by owners, while the other nine farms had an average of 7.6 acres. It is exceedingly interesting to note that these nine owners had almost identically the same area in crops, but had $2,000 less capital. Their total farm receipts were nearly the same, expenses the same, and labor income practically the same. One thing is certain, that the man with small capital should rent rather than buy in that area.

TABLE VII.—*The raising of sugar beets on small farms.*

Items of inquiry (averages).	First group, 16 farms operated by owners.	Second group, 9 farms operated by owners renting additional land.
Farm area owned.....acres..	22.8	12.7
Additional area rented.....do....		11
Area cropped.....do....	19.1	20
Area in sugar beets.....do....	5.2	7.6
Capital.....	$6,103	$4,038
Receipts.....	995	900
Expenses.....	426	457
Farm income.....	569	443
Labor income.....	264	241

The results in Table VII are also interesting in that they show what can be expected of a small 20-acre farm devoted to sugar-beet raising. Only nominal wages are received by the owner following this type of farming. Of the farm owners, 11 received less than $300 as a labor income. Only one man received over $1,000 labor income, he having a few acres of beets in connection with a special poultry farm. Even if these small farmers have no mortgage to pay and have the entire amount of their farm income to live on, their savings and funds for living expenses are small.

It has been estimated from investigations in some of the large cities that the minimum amount necessary annually for a workingman's family of five persons is at least $800. If we allow these small sugar-beet growers their full farm income, which in the case of farm owners is $569, and the value of their family labor, which is $79, we have a total of $648. This, with a house to live in, garden, milk, and other products furnished by the farm, represents their total living. In view of these facts it is very doubtful whether farmers could pay $250 to $300 an acre, the price at which this sugar-beet land is valued, go in debt for the greater part of the purchase price, and be able to complete their payments for the property. Through hard work and very careful saving they might be able to succeed, particularly if one or more members of the family worked at other employment during part of the year. The trouble with a small farm of this nature is that there is not enough work to keep the members of the family busy, even if the crops grown do pay a high rate of income for the labor performed. Outside employment becomes almost a necessity when farms are reduced to such areas as those found in this region.

THE FARMER'S AGE AND OTHER FACTORS.

In connection with the bearing upon his success, the facts shown in Table VIII in regard to the farmer's age, the size of his family, and the amount of the mortgage on his farm are exceedingly interesting.

TABLE VIII.—*The age of the farmer, amount of mortgages, and size of family on farms operated by their owners and on farms whose owners rent additional land.*

Farm groups.	On 69 farms operated by their owners.				On 23 farms whose owners rent additional land.			
	Number of farms.	Age of operator (years).	Amount of mortgage.	Number in family.	Number of farms.	Age of operator (years).	Amount of mortgage.	Number in family.
Small	35	51.2	$57	4.6	10	45.7	$200	5.9
General and fruit	30	49.4	967	6	13	44.8	179	5.9
Grain and live stock	4	56	2,000	5	.....	.....	.....	.....
Total or average	69	50.7	565	5.2	23	45.5	188	5.9

This table gives the age of the operator, the amount of mortgage per farm, and the number in the family. The families are somewhat larger than is shown by similar data for other agricultural regions. The age of the farmer, particularly the farm owner, is 50.7 years, practically the same as found in every region studied thus far. In the case of those men who owned small areas and worked additional

land, the average age was about 5 years less. This would be expected, in that these men represented the transitory step between tenant and owner. It was also noted that on the average the owner had been a tenant 1 year, an owner for 22 years, and an owner of his present farm for 19 years.

In the case of the owners who rent additional land they had been tenants 2 years, owners 18 years, and owners of their present farms 15 years. The average value of the farmhouse was $859; other buildings, $237 per farm.

EFFICIENCY OF WORK HORSES ON SMALL FARMS.

Table IX gives the number of work horses per farm and the average crop area per horse, arranged by type of farming. One work horse to 10 acres is the average for all the farms in this district, the larger farms being the most efficient in this respect. Good authorities estimate that the annual cost of keeping a horse ranges from $80 to $120 a year; hence, each acre in crops must bear an annual charge of at least $8.

TABLE IX.—*Number of work horses and crop area per horse.*

Farm groups.	Number of farms.	Number of work horses.	Crop area per horse.
			Acres.
Small	45	2.0	8.3
General and fruit	43	3.9	11.2
Grain and live stock	4	6.1	12.0
Total or average	92	3.1	10.3

Comparing this with similar studies,[1] it is seen that work horses, as utilized on the small farms in Utah, are only 50 per cent as efficient as those on farms of 80 acres or more.

Aside from survey studies showing the labor incomes of the farmers visited, many data were gathered in respect to the cost of producing certain crops in that area. These data were obtained in the same way as the other facts presented here and not by cost-accounting records.

CROPS GROWN IN UTAH LAKE VALLEY.

SUGAR BEETS.

For the last 20 years sugar beets have constituted an important crop in this valley. They have been grown with success and are

[1] Thomson, E. H., and Dixon, H. M. A farm-management survey of three representative areas in Indiana, Illinois, and Iowa. U. S. Department of Agriculture Bulletin 41, 42 p., 10 fig. 1914.

Warren, G. F., and Livermore, K. C., assisted by Bennett, C. M., Kutschbach, H. N., Thomson, E. H., Robertson, F. E., and Baker, E. L. An agricultural survey in Tompkins County, New York. Cornell University Agricultural Experiment Station of the College of Agriculture, Department of Farm Management, Bulletin 295, p. 375-569, 56 fig. 1911.

looked upon by the farmer as the one dependable crop, providing the money from which he can pay taxes and buy the necessaries of life. It is generally agreed that there are no big profits in sugar-beet growing, yet its adaptability to local conditions and to intensive agriculture places it foremost as a cash crop on a large number of farms. The large amount of labor needed and its wide distribution through the growing season make the sugar beet one of the best crops for the utilization of the farm labor. In many instances the owner's family can do all the work required on several acres of beets; hence, a reasonably large income can be had with no cash outlay.

From $48 to $60 per acre, exclusive of land rental, is given as the approximate cost of growing an acre of beets under normal conditions in the Utah Lake Valley. With yields ranging from 15 to 20 tons, at a price of $4.50 to $5 per ton, it is evident that there is no large margin of profit between the cost and the price received. Yet in view of the fact that a large part of the cost of production is made up of labor which can be performed by the farmer and his family, the farmer can afford to grow beets even if only day wages are earned at such work.

Of course, the profit per acre will vary a great deal on different farms, depending upon the practice followed, the yield, and the sugar content. It is plain, however, that the price per ton paid by the sugar-beet factory can not be decreased to any great extent without causing the total income from an acre to fall below the cost of production. Of late years several growers have had difficulty with blight and also with low sugar content. Many of these troubles can be remedied by more thought to rotation and care in growing the crop.

TOMATOES.

Under an intensive system of agriculture such as that followed in this region, it would seem that the canning factory should have a place. As yet this industry has not developed to any great extent, there being three small canning factories, one each at Provo, Springville, and Spanish Fork. Tomatoes constitute one of the main crops grown for canning. Table X gives the cost of growing an acre of tomatoes as determined from three good growers in that district. The cost per ton, as found on the three farms averaged in Table X, was remarkably uniform considering the wide variation in yields on these farms. Under careful supervision and with a reasonable price for this crop, the growing of tomatoes promises to be a fairly satisfactory enterprise. One serious trouble is in obtaining a variety which can be planted late enough in the spring to escape late frosts and yet mature early enough to escape frost in the autumn.

TABLE X.—*Cost and yield of an acre of tomatoes, average of three farms in the Utah Lake Valley.*

[Yield: Tons, 15.9; receipts therefrom, $166.65.]

Items of cost.	Man hours.	Horse hours.	Cost.
Labor operations:[1]			
Manuring	1.77	3.54	$0.71
Plowing	7.30	14.60	2.92
Disking	1.26	3.02	.55
Spike-tooth harrowing	2.00	4.00	.80
Spring-tooth harrowing	4.65	13.95	2.33
Leveling	1.58	3.53	.67
Marking	1.02	2.05	.41
Trenching	.84	.84	.25
Watering	11.34	.....	2.27
Planting (partly by contract)	10.88	.....	3.46
Cultivating	12.47	12.47	3.74
Hoeing	8.37	.....	1.67
Replanting	.28	.....	.06
Bugging	1.67	.....	.33
Picking (partly by contract)	106.98	.....	30.70
Hauling	25.40	50.79	10.15
Total labor	197.81	108.79	61.02
Items other than labor:			
Manure			.93
Plants			10.18
Crates			1.95
Water			3.26
Interest and taxes on land at 6 per cent			16.88
Equipment			3.91
Total cost other than labor			37.11
Total cost			98.13

SUMMARY.

Account.	Total.	Per ton.	Per bushel.
Income	$166.65	$10.48	$0.26
Cost	98.13	6.17	.15
Profit	68.52	4.31	.11

[1] Rates per hour: Man labor, 20 cents; horse labor, 10 cents.

POTATOES.

The cost of growing potatoes is about the same as that of sugar beets, or a little less. As previously stated, uncertain prices at harvest time and trouble with blight have been the cause of most farmers discontinuing this crop as one of their main cash enterprises.

APPLES.

The history of apple growing in this area is in some respects the same as that in some of the fruit districts in the Pacific Northwest. Many farmers have planted a few acres of apples, but only a small number have made this their entire farm business. Sugar beets, small fruits, potatoes, and peaches have been grown extensively in the young orchards, so that the expense of bringing the orchards

into bearing is not nearly so heavy as where the entire farm is set to apple trees and clean tillage is practiced (fig. 5). If in the future the marketing of apples in the western fruit districts can be made a success in competition with the extensive orchards in the East, then it would seem that these Utah growers have acted wisely in setting a few acres of orchard, as it will help diversify their farm business. Another fact in their favor is that most of the orchards are set to strictly standard varieties. The local market for apples in this region is not sufficient to warrant an acreage of any considerable size; hence, eastern markets must be depended upon.

PEACHES.

The history of the peach industry in this region is an exceedingly interesting one. In the vicinity of Provo several orchards were planted

FIG. 5.—Sugar beets growing in a young orchard.

from six to eight years ago, or about the time that many of the large peach districts were beginning to develop in other Western States; but most of the peach orchards here are the result of an extensive boom started about five or six years ago. In one district at least, the big return in one year from a single acre of old trees, coupled with the promotion scheme of a few growers, started a boom in peach growing which resulted in many hundreds of acres being planted in the two years following.

At present there are many 4, 5, and 6 year old peach orchards in this district. In the vicinity of Springville, at the mouth of one of the small canyons, there is a large area which has been set almost exclusively to peaches. Much of this area, which was originally devoted to general farming, was bought at $75 to $150 an acre, planted with peaches, and then valued in some cases at $300 to $400

an acre. The soil on which these orchards are located apparently is well adapted to this fruit. The location is also good, being well protected from frost.

Since these orchards have been set out there has been no year in which the peach business has been a success financially, owing mainly to the low prices received. Many of these growers are discouraged, and some of them are pulling out first-class 5-year-old peach trees to make the land available for growing sugar beets and other general farm crops. Figure 6 is from a photograph of hogs in a peach orchard. On this particular place the owner had a big crop in 1912. He incurred heavy expenses in picking, packing, and shipping, only to have the returns amount to practically nothing. In 1913 he also had

FIG. 6.—Hogs turned into a peach orchard to harvest the crop.

a good crop, but was not willing to take the chances of picking, packing, and hauling the fruit, so a large number of hogs were purchased in the early summer and the entire crop was fed to them.

It is estimated by several growers in the vicinity that the value of orchard land has depreciated about 40 per cent in the last four years. The estimated cost of producing a crate of peaches is 30 to 34 cents. This estimate was obtained from a number of reliable peach growers. It includes the cost of caring for the orchard, picking, packing, and hauling to the station. No charge for interest on land is included in this figure. Many years the price of peaches has fallen far below 30 cents a crate (22 pounds). The cost of growing the orchard is high and crops are occasionally poor. These are some of the factors that have made the peach industry a losing one.

It would seem that there ought to be some way of taking care of these peaches other than shipping them to far eastern markets in crates. In the practice now followed there is a heavy expense for boxes, and as each peach has to be wrapped in paper the packing cost is high. Furthermore, only the best grade of fruit is packed, and the loss resulting from no returns from all medium and inferior fruit is enormous. Some method whereby these other grades of peaches, and apples as well, could be utilized would result in a great saving for these growers.

SMALL FRUITS.

The small-fruit industry is represented by strawberries, blackberries, raspberries, etc., and apparently is a much more stable one than peach growing. In the first place, it is developed on a more safe and sane basis, not being overdeveloped, as are the peach and apple enterprises. The market for these fruits, however, is small and the outlook not at all promising, unless there is some means of canning or preserving them for shipment. These fruits seem to do very well in this region and could be produced to advantage on the small farms. The whole question is one of a suitable market. A few men haul these fruits a distance of 40 miles to Salt Lake City. Some growers give the price of raspberries as 85 cents per case of 6 quarts and of strawberries 65 cents per case. A yield of 300 to 400 cases per acre is considered very good for both of these berries.

At Provo there is a canning factory which paid during the year 1913 the following prices for berries, fruits, and truck crops:

Strawberries	per pound	$0.04½	Grapes	per pound	$0.01
Cherries	do	$0.05 to .06	Prunes	do	.01
Plums	do	.01	Peaches	per ton	12.50
Pears	do	.01 to .01½	Apples (no wormy ones)	do	12.50
Apricots	do	.01¼	Tomatoes	do	10.00

ALFALFA HAY AND SEED.

In the past, considerable alfalfa hay and seed have been grown in this region, but of late years serious trouble with the weevil has hurt this industry. At the present time the quarantine against the seed from this district has stopped its production. Good stands of alfalfa hay are also seriously injured by the weevil in some localities, as little attention has been given to preventive measures. Alfalfa hay is grown mostly for home consumption, the distance to outside markets being too great to permit shipment at a profit. Hence, the quantity of hay that can be grown profitably will depend entirely upon the development of the immediate area (fig. 7). In some instances range men bring their cattle and sheep from the mountains in the fall for feeding through the winter in the valley. This supplies a good market for considerable hay and grain. The beet pulp from the sugar factories is also utilized by feeding it to range steers.

STRAWBERRY VALLEY IRRIGATION PROJECT.

The land to be opened up by the Strawberry irrigation project is apparently of the same nature and subject to the same conditions as the areas already irrigated. Much of it is rather low and will have to be handled carefully to prevent alkaline conditions resulting. At present this dry land, practically all of which is owned privately, is held at prices ranging from $50 to $100 an acre. In some instances even higher prices are being asked.

The water rights, as obtained from the irrigation project, will cost from $60 to $80 an acre. After this there will be a large expense for putting the land in shape for good cultivation. Many ditches will have to be constructed, the land broken up, buildings and fences

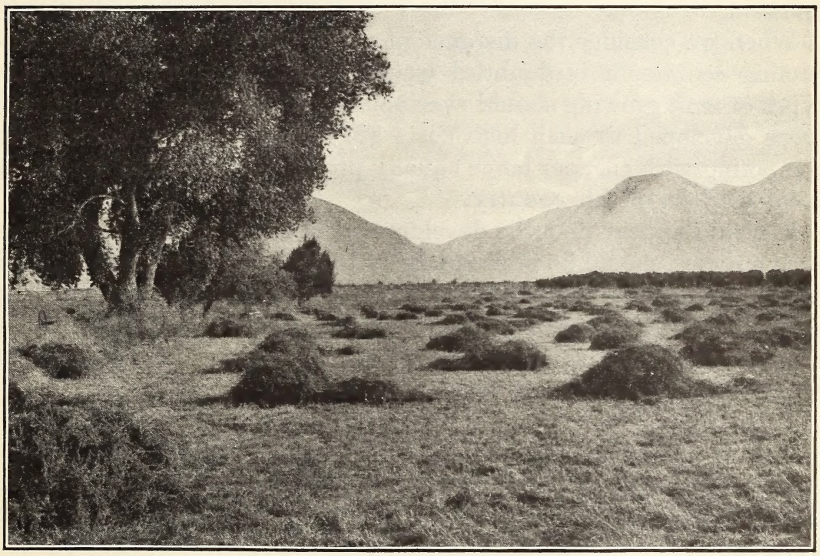

FIG. 7.—Harvesting alfalfa hay on irrigated lands.

erected, and, if the future is to be thought of, drains should be constructed. Summing up all of these costs, there will be a very heavy charge per acre to the settler on these new areas. Good results are seldom obtained the first year with the ordinary farm crops. Whether this land can be purchased at this price and paid for under the existing conditions, as judged from the experience of men now in the valley, is a question. At the best it will call for very efficient farm organization and first-class management.

FARM ORGANIZATION.

It is exceedingly important that the farms be not too small in area, so that the owner will have a moderate-sized business and one which can be efficiently operated. It is also important that the right crops,

those which will meet the economic conditions, be selected. This is a problem of great difficulty, for the reason that the conditions change so rapidly from year to year that certain enterprises which may be good at this particular time may be unfitted to the conditions five years hence.

To illustrate: Suppose the price paid by the factories for sugar beets should decrease materially. This would be a serious blow to the agricultural development of the entire region, as sugar beets constitute the chief money crop. It would seem that special attention should be given to the development of canning factories, fruit evaporators, and other similar agencies whereby crops suitable to intensive cultivation can be grown annually without being subject to heavy losses resulting from violent fluctuations in prices in the eastern markets.

When we consider the distance of this region from the great consuming centers, it is doubtful whether truck farming and certain types of fruit growing should ever be undertaken here. Agricultural areas developed at such high costs are under a severe handicap in competing with cheaper lands equally productive that lie close to the great markets of this country.

It would appear that the development of such types of farming in such a region should be limited largely to supplying the local demand for the products grown. With the immense areas of fertile soil that are still farmed extensively close to our big cities, it would seem that the time is not yet ripe for a highly intensive type of agriculture on lands so far removed from those markets.

SUMMARY.

The results of the preliminary farm-management survey made in the irrigated areas in the Utah Lake Valley near Provo and Spanish Fork show—

(1) That an intensive type of agriculture has been developed in certain areas that have been under irrigation for a long period of years. This intensiveness is largely in the form of sugar-beet growing.

(2) The average labor income on 35 small farms with 16.5 acres in crops was $247; on 30 general fruit and sugar-beet farms with 42 crop acres the labor income was $589; and on 4 grain and live-stock farms with 74 crop acres the labor income was $620.

(3) The profits received are largely influenced by the size of the farm business, the type of farming followed, and the diversity of the income. Many farms are so small in magnitude of business that the owner can not possibly make a comfortable living without outside employment. Of the 54 farmers who had less than 40 acres, only 2 men made over $1,000 labor income. More than 60 per cent of them made less than $300. Of 25 small sugar-beet growers, only 1 made over $800 as a labor income.

(4) Sugar beets form 33.4 per cent of the total farm receipts on the 92 farms operated by owners. They are the one crop on which the farmer depends for money to pay taxes and living expenses.

(5) The growing of other crops, such as small fruits and vegetables, which are suited to intensive agriculture, is seriously limited by market conditions, as a large quantity of these products creates a surplus on the markets in the near-by cities and towns.

(6) Peach growing was boomed very highly about four to six years ago. This has proved to be decidedly unprofitable except in a few instances. Several farmers estimated that the value of peach land has depreciated 40 per cent in the last four years.

(7) The possibility of the soil becoming alkaline, due to seepage of irrigation waters and to capillary attraction when the water table is near the surface, makes this a serious question on the lower areas.

(8) The high initial cost of land, plus the cost of water rights, plus the cost of improvements, all combine to make such a heavy investment that intensive agriculture becomes almost imperative, even though such a form is wholly unsuited in its market relations.

(9) In most successful forms of intensive agriculture diversification of enterprises is important. The limited markets in this region are in this way a severe handicap to the most efficient farm organization.

(10) Summing up the situation, it will be very difficult to make either an extensive or an intensive form of agriculture really successful in this region, by reason of the fact that the one needs cheaper land than is to be had, while the other demands a larger and more accessible market than is available. It is plain that on the whole a fairly extensive type embodying staple crops must prevail, for the time is not yet ripe for a highly intensive form of agriculture.

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